

Washburn Crosby Company Elevators No. 2 & 3
900 and 1000 Second Street South
Minneapolis
Hennepin County
Minnesota

HAER No. MN-92

HAER
MINN
27-MINAP
28-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
United States Department of the Interior
National Park Service
Great Lakes Systems Office
1709 Jackson Street
Omaha, Nebraska 68102-2571

**HISTORIC AMERICAN ENGINEERING RECORD
WASHBURN CROSBY COMPANY ELEVATORS NO. 2 AND 3**

HAER
MINN
27-MINAP
28-

Location: 900 and 1000 Second Street South, Minneapolis, Hennepin County, Minnesota

UTM: NE: 15.480080.4980260
SE: 15.480080.4980200
SW: 15.479940.4980260
NW: 15.479970.4980320
N: 15.480040.4980300

Quad: Minneapolis South, Minn.

Date of Construction: 1916, 1929

Present Owner: City of Minneapolis, Minnesota

Present Use: Vacant

Significance: Washburn Crosby Company Elevator No. 2 was designed and built with a large and innovative unloading and grain-weighing facility for railroad boxcars. The large storage capacity allowed the parent company, Washburn Crosby (WCCO), to maintain an ever-expanding flour-milling operation at St. Anthony Falls in Minneapolis. Washburn Crosby was one of the world's largest milling firms and became the central unit in the formation of General Mills, Inc., in 1928. Elevator No. 3 was built as a storage annex for No. 2, and virtually doubled its capacity. Elevators Nos. 2 and 3 functioned as captive elevators for the original parent firm and, in that capacity, were integral elements in the grain supply network for the Minneapolis flour-milling industry.

Historians: Robert M. Frame III, Charlene K. Roise, and Denis P. Gardner, Hess, Roise and Company, Minneapolis

The Washburn Crosby Company and General Mills, Incorporated

The Washburn Crosby Company, the firm that built and operated the WCCO Elevator No. 2, was incorporated in the state of Minnesota in July 1889 with a capital of \$500,000. While the firm had a long and complicated heritage of flour mills and millers, it largely dated to an 1879 partnership of Cadwallader C. Washburn, John Crosby, William H. Dunwoody, and Charles J. Martin, under the firm name of Washburn, Crosby and Company. The new 1889 company was comprised of James S. Bell, president; William H. Dunwoody, vice president; and Charles J. Martin, secretary and treasurer. The remaining directors were: John Crosby, Samuel Bell, Jr., John Washburn, and Alfred V. Martin.¹

Washburn Crosby [variously presented as "Washburn Crosby," "Washburn-Crosby" and "Washburn, Crosby"; and abbreviated at the time, and in this paper, as WCCO] was a flour-milling company that, despite eventual milling interests elsewhere in the United States, was focused almost exclusively on its operations in the milling district of Minneapolis, Minnesota, at St. Anthony Falls on the Mississippi River.²

In the years between the turn of the century and the mid-teens, the Minneapolis milling district had matured as the flour-milling capital of the world. This title had been earned through technological innovations in the industry that had occurred in the local mills in the 1870s and 1880s, principally the development of the middlings purifier and the modern roller mill. Thanks to the major water power available at the Falls of St. Anthony--the only waterfall on the entire Mississippi River--large, factory-style merchant flour mills were constructed that dwarfed previous commercial operations in both physical plant and production capacity. The industrial infrastructure at the Falls expanded continually in the years following the 1879 partnership. Waterpower use was further developed, new mills were built and were filled with the latest milling machinery designed to continually increase quantity and quality, and rail access to the mills followed apace.³

¹ William C. Edgar, *The Medal of Gold: A Story of Industrial Achievement* (Minneapolis: The Bellman Company, 1925), 134-35; James Gray, *Business without Boundary: The Story of General Mills* (Minneapolis: University of Minnesota Press, 1954), 35; Charles B. Kuhlmann, *The Development of the Flour-Milling Industry in the United States with Special Reference to the Industry in Minneapolis* (Boston: Houghton Mifflin Company, 1929), 132-33.

² Edgar, 134-35; Gray, 35.

³ See discussion in Robert M. Frame III, "The Progressive Millers: A Cultural and Intellectual History of the Flour Milling Industry, Focusing on Minneapolis, Minnesota," Ph.D. dissertation, University of Minnesota, 1980, 37-131.

Two mills in particular, the two largest in the world, faced each other across the river at the center of the Minneapolis milling district: the Pillsbury A Mill, erected in 1881, and the Washburn A Mill, erected in 1879 by the Washburn Crosby and Company partnership. The huge stone Washburn A Mill was the heart of the WCCO operations, although it was supplemented, at various times, by Washburn mills B, C, D, E, F, G, a rye mill, and various grain elevators, as well as mills in Buffalo and other cities.⁴

As the WCCO milling operations in Minneapolis expanded in capacity and output, so did the need for wheat. When the A Mill was erected in 1879, its wheat needs were met by an internal "wheat house," an elevator-like storage area divided off from the milling section of the building. It proved to be inadequate for the mill's needs and the company began the design and construction of a series of additional elevators, including elevator houses No. 1 and No. 2, the latter being the first of the two elevators in this study.

On June 20, 1928, all the properties of WCCO were joined with several other companies in the formation of General Mills, Incorporated (GMI), a Delaware corporation whose headquarters remained in Minneapolis. James Ford Bell from WCCO was the board chair of the new firm. He was joined on the new board by several others from WCCO along with representatives of the other companies involved in the consolidation. WCCO remained a separate corporate entity, at least nominally, and some detailed records of GMI's work--such as that of the Minneapolis elevators--were created as the records of WCCO. For all practical purposes, however, all Washburn Crosby properties now were referred to as General Mills properties and were noted in the GMI annual reports with no other company name or reference.⁵

It was during the GMI incorporation and consolidation process that the second grain elevator in this study, WCCO No. 3, was planned. It was designed and completed in the year or two following the incorporation.

Grain Elevator Design and Construction

Elevator Type

WCCO Elevator No. 2 is a "receiving elevator," meaning that it is designed to receive and hold grain for a nearby processing plant, in this case the firm's flour mills on the west side of St. Anthony Falls in the Minneapolis milling district. In general, it is similar to a

⁴ Edgar, 370.

⁵ Gray, 120-42; "Certificate of Incorporation of General Mills, Inc.," June 10, 1928, copy filed in State of Minnesota, Department of State, July 7, 1928, now in Minnesota Secretary of State office.

"terminal elevator," a functional type designed to receive, store, and ship out grain in large quantities for additional transportation. A terminal elevator is very large in comparison to a "country elevator," which receives grain in relatively small quantities from local growers and ships the grain out via rail. The storage area, or bin section, of the receiving elevator may be almost identical to that of the terminal elevator. Since the receiving elevator is intended to take in large quantities but ship out only as much as the mills would need, it has extensive rail (or, later, truck) unloading and "receiving" facilities, but only minimal--if any--rail or other type of out-loading or shipping facilities. In the case of WCCO Elevator No. 2, the shipping function was limited, historically, to a conveyor in an underground tunnel, linking the elevator to the milling complex.⁶

WCCO Elevator No. 3 is known as a "storage annex," meaning that it has no unloading facilities at all and is designed only to have grain moved in and out via a conveyor link with No. 2, for which it is the annex.

Internal Elevator Functions

A terminal elevator usually has substantial facilities for improving grain quality, including drying, cleaning, washing, separating, and sizing, as part of its potentially long-term and large-scale storage function. A receiving elevator, however, may have only minimal improvement equipment, since the mill or mills that it serves are usually well-equipped for that purpose. WCCO No. 2 had very limited cleaning equipment and little else for improving quality. WCCO No. 3 had no quality-improvement equipment.⁷

Elevator Ownership

Elevator ownership is another distinction among elevators. Robert T. Beatty, in "Handling Grain in the Northwest," pointed out three types of elevator ownership in Minneapolis at the time that WCCO No. 2 was built: the "regular" house under Chamber of Commerce rules, the public house, operating under state rules, and the private house. Regular and public elevators were designed to operate under rules governing warehouse receipts providing strict controls over the registering and grading of the grain that was handled there. This facilitated the interactions involved in the selling and trading of grain on the market. A private house, on the other hand, did not need to be involved in the public grain trade and, therefore, could design its operation--both economically and physically--to accommodate the needs of its

⁶ See discussion in "Elevator Functional Types," in Part I of Robert M. Frame III, "Grain Elevators in Minnesota," National Register of Historic Places Multiple Property Documentation Form, September 30, 1989, copy at Minnesota State Historic Preservation Office, St. Paul.

⁷ Ibid.

private owner, in this case a flour-milling enterprise. The storage capacity of a private house helped determine the ability of a milling company to make grain purchases in appropriate quantities at optimal times. As described by Beatty:

As a rule, the bulk of the crop moves within a very few months after the beginning of harvest each year. If the mills are not then prepared to buy and store for later requirements, the wheat moves out of the country, either to other milling centers or is exported to Europe.

In order to get the necessary qualities, the mills, especially the larger ones, therefore find it essential to build storage and accumulate supplies for future needs, rather than wait until later, when wheat has largely moved, is scarcer, and the stocks available are largely elevator wheat.⁸

Reinforced Concrete Design

By the time that WCCO Elevators Nos. 2 and 3 were built in 1916 and 1929 respectively, reinforced concrete was the material of choice for grain elevator construction. During the last decades of the nineteenth century and the early years of the twentieth, grain elevator builders experimented with a wide range of materials that would be strong, economical, and, above all, fire resistant: wood, brick, tile, steel, and reinforced concrete.

Historically, Minnesota--and Minneapolis in particular--was at the forefront in major elevator construction efforts for all materials, but it was the pioneering efforts in reinforced concrete that have made the state legendary. Almost any article written about grain elevators will comment on "Peavey's Folly," the world's first circular reinforced-concrete elevator. Architectural and engineering historian Reyner Banham discusses it in great detail, chiding local historians for being so "cautious" as to declare its "first in the world" status as merely "probably." The reinforced-concrete elevator is the second of the two solutions that Minneapolis provided to the problem of finding a sufficiently rigid material for cylindrical bins, the first being the tile elevator. As Banham observes, the tile bin "was to be short-lived but conceptually important; . . . the reinforced concrete bin . . . was to become the 'industry standard' worldwide."⁹

The world's first circular, reinforced-concrete elevator, referred to above, was built in 1899 in Minneapolis, as the collaborative effort of grain dealer Frank H. Peavey and contractor

⁸ Robert T. Beatty, "Handling Grain in the Northwest," *Northwestern Miller* 108 (December 13, 1916): 749.

⁹ Reyner Banham, *A Concrete Atlantis: U.S. Industrial Building and European Modern Architecture, 1900-1925* (Cambridge: MIT Press, 1986), 133.

Charles F. Haglin. The single bin or tank, 20' in diameter and 68' high (later raised to 125') was reinforced with steel bands. It was constructed with movable, sliding or "slip" forms, pioneering the technique that was to make the construction of seamless, monolithic concrete tanks technically and economically feasible. The original 1899 elevator, termed the Peavey-Haglin Experimental Reinforced-Concrete Grain Elevator, still stands in the Minneapolis suburb of St. Louis Park and is a National Historic Landmark.¹⁰

Following the Peavey-Haglin experimental elevator, a cluster of 15 bins was built by Peavey in Duluth, Minnesota, in 1900, followed by a second 15 bins in 1901. Soon concrete elevators were being erected in a variety of locations. Among the early concrete elevators was WCCO Elevator No. 1, erected adjacent to the firm's 1879 A Mill in 1908 by the Haglin-Stahr Company. This still-extant 600,000-bushel elevator is among the early reinforced-concrete elevators built in Minneapolis, along with Terminal Elevator "T" Annex built by the Barnett and Record Company, and Merchants Elevator built by L.O. Hickok and Son--all in 1908.¹¹ By 1911, elevator engineer Milo Ketchum felt that the cost of a concrete elevator had dropped below that of steel and that concrete had attained a financially competitive edge.¹²

"We are in the age of concrete," wrote G.M. Potter in the 1913 edition of *Plans of Grain Elevators*.¹³ According to Banham, "the cylindrical reinforced concrete bin rapidly became the prime constructive element in what might be termed the normative grain elevator and thus became a symbol of curious and ultimately atavistic power in America, as its characteristic silhouette came to dominate vast expanses of land, such as the prairies or the Texas Panhandle, where the only other object of enough bulk and height to compete with it for attention was the almost identical elevator in the next town."¹⁴

¹⁰ Robert M. Frame III, "Peavey-Haglin Experimental Concrete Grain Elevator," National Register of Historic Places Nomination Form, May 12, 1978. Copy at Minnesota State Historic Preservation Office, St. Paul.

¹¹ Charles Schmucker Clark, ed., *Plans of Grain Elevators*, 3rd ed. (Chicago: Grain Dealers Journal, 1913), 33-35.

¹² Milo S. Ketchum, *The Design of Walls, Bins and Grain Elevators*, 3rd ed., rev. and enlarged (New York: McGraw-Hill Book Company, 1919), 305-06.

¹³ G.M. Potter, "Reenforced [sic] Concrete for Grain Elevators," in Clark, ed., *Plans*, 1913 ed., 54.

¹⁴ Banham, *Concrete Atlantis*, 142-43.

James Stewart and Company and the Development of Slip-Form Construction

James Stewart and Company, designer and builder of WCCO Elevator No. 2, was formed in 1884 when James Stewart took his son, Alexander Mair Stewart, as a junior partner in the father's architectural and building work in St. Louis, Missouri. The elder Stewart retired in 1892 and died in 1902, with the business carried on by his sons Alexander and James Christian. The firm became an international builder, responsible for many major structures worldwide, including: the state capitols of Idaho, Oklahoma, and Utah; the U.S. Chamber of Commerce building in Washington, D.C.; the U.S. Courthouse in New York City; and the Jefferson Memorial in St. Louis.¹⁵

In addition to these public structures, Stewart designed and built many significant industrial plants and structures in the United States and elsewhere. A particular specialty was grain elevator construction in reinforced concrete and, in the company's centennial history in 1944, Stewart declared itself "today recognized throughout the world as the leading designer and builder of structures for the storage and handling of grain."¹⁶ The 1944 volume notes many elevator-type storage structures constructed for railroads, milling companies, and cement companies. Stewart was responsible for building the Port of Albany, New York elevator for Cargill, Inc., a 13.5-million bushel facility that Stewart (in 1942) claimed was the largest grain elevator in the world.¹⁷ For WCCO, Stewart built elevators at Minneapolis, Buffalo, New York, and Louisville, Kentucky.¹⁸

Stewart publicists claimed credit for two innovations: the sliding slip form for continuous concrete construction of grain elevators, and the modern car dumper, a huge mechanical device designed to empty grain from railroad boxcars, the rail shipping car used until the hopped-bottom grain car was developed in more recent years.¹⁹

While the Stewart company's history stated that "Stewart engineers invented the sliding

¹⁵ *A Century in Construction: An Historical Account [of] James Stewart & Company* (New York: Privately Printed, 1944), 1-11, 15, 23.

¹⁶ *A Century in Construction*, 170.

¹⁷ *Grain Elevators of North America*, 5th ed. (Chicago: Grain and Feed Journals Consolidated, 1942), 493.

¹⁸ *A Century in Construction*, 178.

¹⁹ *Ibid.*, 169-70.

form,"²⁰ the more accurate story is that the firm's engineers developed a widely used version of the form. According to R.H. Folwell and R.P. Durham, engineers involved in early slip-form construction, "the idea of the slip form is old and entered the minds of nearly every engineer or builder engaged in construction of concrete walls. The grain elevator engineers of the U.S.A. undoubtedly should be credited with the practical development and improvement of the slip form art to its modern perfection."²¹

As noted above, even the 1899 Peavey-Haglin elevator used slip-form construction, and Haglin's patented technology is described by Folwell. The earliest sliding-form designs, such as that of Haglin, rested the forms on the hardened concrete of the most recent pour and did not continue up while the concrete remained in a plastic state.²² According to Folwell, "the first example of actually slipping the forms while the concrete was still plastic, was in the construction of the Storage Annex for the King Elevator of the Canadian Pacific Railroad at Port Arthur, Ontario, in 1903." The contractor was the Minneapolis firm of Barnett and Record, and Folwell was their head of engineering. Folwell went on to work for James Stewart and Company, builders of WCCO Elevator No. 2 in 1916.²³

Folwell concludes that the "modern practice of constructing monolithic concrete walls with slip forms did not really begin until jacks were invented that reacted upon vertical pipes or rods that were embedded and left in the concrete walls." Among the various patents for such devices was the "Folwell-Sinks Hollow-screw Jack," patented in 1907.²⁴ Folwell reported that this design consisted "of a hollow screw made of Shelby tubing reacting upon a one-inch diameter reinforcing rod" embedded in the concrete wall.²⁵ A version of this jack is believed to have been used in the construction of WCCO Elevator No. 2.²⁶

²⁰ Ibid., 170.

²¹ R.H. Folwell and R.P. Durham, "The Development of Methods of Raising Slip Forms Used in Forming Concrete Bins," *Grain Dealers Journal* 79 (December 22, 1937): 542.

²² Ibid., 543.

²³ Ibid., 545-46: "In February, 1905, Mr. R.H. Folwell, formerly chief engineer, and Mr. W.R. Sinks, formerly General Superintendent of Barnett and Record Co., became associated with James Stewart and Co. as Engineers and Managers of their Grain Elevator Department."

²⁴ Ibid., 546; Patent No. 855,452, June 4, 1907.

²⁵ Folwell and Durham, 546.

²⁶ See historic photographs HAER No. MN-92-32 and MN-92-33.

WCCO's Need for Grain Storage

The addition of large, external grain storage structures to the WCCO milling complex at St. Anthony Falls began with the construction of Elevator No. 1, completed in 1908. According to William C. Edgar, then editor of the *Northwestern Miller* and later author of a book-length history of WCCO, Elevator No. 1 was first advocated in 1905 by Franklin Muzzy Crosby.²⁷

Franklin M. Crosby was the son of WCCO's John Crosby. Born in 1875, he joined his father's firm in 1898 and, as Edgar writes, "devoted himself to the grain interests of the company, soon becoming its grain buyer and a wheat expert."²⁸ He also became a vice president and a director. In 1899, he started buying grain, and in 1911, was put in charge of wheat purchasing. According to a family biography, he became quite skilled in the grain trade:

For eighteen years he worked on the trading floor of the Minneapolis Chamber of Commerce (now the Minneapolis Grain Exchange), and enjoyed himself immensely. By spending a great deal of time studying the characteristics and milling qualities of wheat he soon became one of the most capable grain buyers in the business. The intricacies of the commodity market with its hedging, spreading, anticipating the actions of competitors, and predicting crop levels captured the interest of his quick mind.

Under Franklin Crosby's direction the Washburn Crosby Company became known as a concern that brought its wheat on the closest and most economical basis possible.²⁹

Crosby's experience and interest in wheat purchasing would be influential in the planning for the firm's additional grain elevators. According to Edgar, Crosby argued in 1905 that a new, large elevator "would be a profitable investment and that the saving in the cost of handling wheat and demurrage charges would fully justify it. He gave such convincing reasons for his proposal that in 1906 the contract for Elevator Number One was let." Compared to the later elevators, Nos. 2 and 3, this first example was small, with a mere 615,000-bushel capacity in 15 reinforced-concrete bins. It was begun in March 1906 and completed in January 1908 at a cost of \$247,000. "The elevator was so arranged as to permit the unloading of wheat promptly to all the mills of the company in quantities large enough to meet their

²⁷ Edgar, 253.

²⁸ Ibid.

²⁹ Virginia Huck, *Franklin and Harriet: The Crosby Family Story* (Minneapolis: The Crosby Company, 1980), 124-35.

requirements."³⁰ Elevator No. 1 is extant, as part of the Washburn A Mill complex in today's St. Anthony Falls National Register Historic District.

In the WCCO annual report for 1914-15, Franklin Crosby argued in the Wheat Department's report for increased storage at the Minneapolis complex: "Our shipments [of incoming wheat and rye] have increased to a point where we are unable to unload the wheat and accumulate any surplus with our present unloading facilities." He said that "having an efficient and up-to-date unloading plant available at all times . . . would place us in the market in much better condition than we are today." At the time, some 1.5-million bushels of wheat were being stored in outside facilities, a practice that was costly and not under the milling firm's direct control. Crosby also argued the advantage of having expanded unloading facilities to take advantage of taking in wheat directly from the current crop rather than from elevator storage, stating that "this simply results from the wheat being picked on a milling basis, rather than an elevator basis." Finally, he noted:

The Pillsbury Company [directly across the Mississippi from Washburn Crosby] are already starting increased storage, giving them a 3,500,000 capacity, which will place them in the market when favorable times occur. If we are to successfully compete with them in the Wheat Department, we must have increased storage and additional unloading facilities.³¹

In his separate "Report on Wheat Problems and Market Conditions" in the same company annual report, Putnam Dana McMillan, Jr., echoed each of Crosby's points and added: "An additional reason why we need more storage, is the increased varieties of wheat which should be binned separately."³²

WCCO president John Washburn, in his annual report summary, concluded:

³⁰ Edgar, 253.

³¹ Franklin M. Crosby, "Report of Wheat Department, 1914-15," 3-5; in "Annual Report, Washburn-Crosby Co., Sept. 1, 1914 to Sept. 1, 1915"; unpublished; typescript copy in General Mills, Incorporated, Archives, Minneapolis (hereafter referred to as GMIA).

³² Putnam D. McMillan, Jr., "Report on Wheat Problems and Market Conditions," 4, in "Annual Report, 1914-15," typescript, GMIA. Beatty comments on grain varieties: "[Private wheat storage at the mills] enables them to accumulate stocks of various varieties of wheat, so that they can get a mixture balanced in accordance with tests and milling experience that gives the best results. . . . To get the necessary selections for mixtures, the mills have to draw from a very wide area. This was illustrated recently at Minneapolis when wheat offered for sale on the floor of the Chamber of Commerce on one day came from upward of a dozen states and from the three western provinces of Canada" (Beatty, "Handling Grain in the Northwest," 749).

We have now fully made up our minds to build large storage tanks near our mills with a capacity of not less than 1 1/2 [million] bushel construction similar to the fire-proof tanks that we built at Buffalo. We will go right ahead with this improvement; getting out our plans this winter so that the tanks can be erected as soon as weather permits. With this needed improvement it will place our milling plant in a more modern and up-to-date position, and we believe it will pay for itself in a few years. We are now paying considerable money for wheat storage which will be done away with as soon as the tanks are ready for use.³³

Planning and Building New Elevators for Washburn Crosby

The WCCO board of directors' minutes through the winter of 1915-16 reported on negotiations for the projected elevator's site. A board resolution moved by Franklin Crosby was passed on March 20, 1916 to settle the land acquisition:

RESOLVED, that the officers of this company be and they hereby are authorized to purchase from the Minneapolis & St. Louis Railway Co. at \$1.50 per square foot, and under such terms and conditions as they deem advisable, the tract of land in the City of Minneapolis bounded on three sides by 10th Ave. South, 2nd Street South and 9th Ave., known as part of Block 118, Town of Minneapolis, and comprising altogether approximately 77,000 square feet.³⁴

The minutes of the same meeting also noted "our having agreed on March 14, 1916 to purchase the steel for the proposed new Elevator 2 from Messrs. Barnett & Record at \$2.04 per 100# in fulfillment of the latter's option with the Illinois Steel Company, this step being taken in order that a considerable sum might be saved by obtaining the steel at the price mentioned, rather than at the advanced current market price." Finally, another resolution settled the elevator's cost at "approximately \$500,000.00 and its capacity from 2,000,000 to 2,500,000 bushels."³⁵

In April 1916, the Minneapolis City Council passed a series of ordinances to authorize and govern the plan and construction of the 1,000' tunnel needed to connect the new elevator

³³ John Washburn, "Annual Report," 2, in "Annual Report, 1914-15," typescript, GMIA.

³⁴ "Washburn-Crosby Company, Book of Minutes, No. 3," p. 197, March 20, 1916; see accompanying plat map of site, p. 192; typescript copy in GMIA.

³⁵ "Washburn-Crosby Company, Book of Minutes, No. 3," p. 197, March 20, 1916.

with Elevator No. 1 and the milling complex, as well as the railroad tracks and two new bridges needed to access the new elevator and cross various city streets.³⁶

The *Minneapolis Journal* reported in April, following an announcement by WCCO President John Washburn, that the new elevator "will be the most massive and tallest industrial building in the city," and "will be the first built on the west side of the river well outside the old congested milling district."³⁷ On July 12, 1916, the Stewart company received a Minneapolis building permit to construct a reinforced-concrete grain elevator at 102-28 Tenth Avenue South in Minneapolis (a.k.a 900 Second Street South).³⁸

Progress on the new elevator was noted in the various subdivisions of the WCCO annual report for the following year, 1915-16. The "Report of Manufacturing Department, September 1, 1916" stated:

Ground was purchased in the early spring at Tenth Avenue South and Second Street, and the work of preparing the site for the building was begun May 1st. It was necessary to remove about 100,000 cubic yards of earth before beginning the building, so that actual building operations were not started until July 10th. We hope to have the elevator ready to receive grain by December 15th. Its capacity is to be two and a quarter million bushels. It is to be connected with the milling plant by a tunnel 700 feet long, through which grain will be delivered by means of two belts, each having an hourly capacity of 20,000 bushels. The total cost of elevator and group will be \$550,000. The trackage, receiving and weighing arrangements will be ideal, and when completed will, we believe, be the greatest improvement made to the Minneapolis plant.³⁹

³⁶ See *Proceedings of the City Council of the City of Minneapolis, Minnesota, from January 1, 1916 to January 1, 1917* (Minneapolis: City Council, 1916), April 20, 1916, 349-355; see also tunnel discussion in "3,000,000-Bushel Elevator Planned to Supply Mills," *Minneapolis Journal*, April 7, 1916, 1.

³⁷ "3,000,000-Bushel Elevator Planned to Supply Mills," *Minneapolis Journal*, April 7, 1916, 1.

³⁸ Minneapolis Permit No. A-13343, July 12, 1916, at Minneapolis Department of Inspections. The permit states that the new elevator was to be 172' x 288' x 138' high, was estimated to cost \$500,000, and would be completed by November 15, 1916.

³⁹ "Report of Manufacturing Department," unsigned, 1-2, in "Annual Report, Washburn-Crosby Co., Sept. 1, 1915 to Sept. 1, 1916," unpublished; typescript copy in GMIA.

In the Wheat Department's report, Franklin Crosby declared:

This new elevator will prove a great help in every way. We are unable to unload, at the present plant, wheat in sufficient quantity to take care of the increased output and there are many times when certain types of wheat are unavailable and we have no bins for them. The new elevator should place us at all times in the market for the various types of wheat as they move.⁴⁰

Crosby pointed out that the rail arrangement involved movement "in one direction and should be a great saving of switching." Lastly, he discussed the possibility of installing a new device for emptying railroad boxcars, a "tilting table," manufactured by the Link Belt Company. The large machine would move and tilt the entire railcar, in effect shaking the wheat out the side doors in six minutes, instead of employing a crew of men to unload the car in the conventional manner, which employed large manually guided, scoop-like shovels attached to cables connected to a power source inside the elevator. Crosby noted ongoing talks with a "Mr. Sinks of the Stewart Co.," who "would not consider these tilting tables when designing the house, but has recently told me that such tables have been specified in the new Baltimore Elevator and also the new Pennsylvania Railroad Elevator being built in Philadelphia." Perhaps, Crosby concluded, such tables could be installed at a future time, "directly west of the present track shed."⁴¹

The completion and initial operation of Elevator No. 2 was reported in the WCCO annual report for 1916-17. W.H. Bovey in his "Annual Report of the Manufacturing Department" declared that "in our opinion, it is the greatest addition ever made to the Minneapolis Plant." P.D. McMillan's report stated: "We believe it stands now [as] the latest development in the rapid, efficient handling of grain." E.C. Staples said, in the "Annual Report [of the] Minneapolis 'A' Mill Office," that the new elevator's completion "has resulted in the removal of the wheat unloading from the old [No. 1] elevator and has afforded great relief, not only on the so-called 'Elevator' and 'Spur' tracks, but on the congested tracks at the front of the mills." The Treasurer's Report listed the cost for Elevator No. 2 at \$592,790.58.⁴²

⁴⁰ Franklin M. Crosby, "Report of Wheat Department," 5, in "Annual Report, 1915-16," GMIA.

⁴¹ Ibid., 5-6.

⁴² W.H. Bovey, "Annual Report of the Manufacturing Department," 3; Putnam D. McMillan, "Report on Wheat Problems and Market Conditions," 5; E.C. Staples, "Annual Report, Minneapolis 'A' Mill Office," n.p.; "Treasurer's Report," 3, in "Washburn-Crosby Company, Annual Report, September 1, 1916 to September 1, 1917," GMIA.

The most thorough review came from Crosby in the "Report of the Wheat Department."
"The new elevator is almost perfect," he wrote:

The new elevator has broken all records, at least that we know of. We have already had one day's unloading of 203,000 bushels with one entire crew of green men and one, half green men; one crew thru at four and the other thru at five. This means that with wheat available in the Yard, 200,000 bushels will be easy for the regular trained crews of six men in ten hours.

We expect very shortly to have the two belts from Elevator #1 to the mills and this will greatly facilitate the shipping of wheat and not make necessary the constant night work we have had in the past.⁴³

Crosby's only sour note came in reference to the "tilting tables" and Mr. Sinks of the Stewart Company:

We regret exceedingly that Mr. Sinks of the James Stewart Company did not cooperate with us more in developing a tilting table for the unloading of wheat, but he opposed any suggestions along these lines until the elevator was practically completed and then it developed that he had secured patents on all these devices. An explanation from Mr. Sinks is due.⁴⁴

Crosby also voiced his criticism at the March 16, 1917, board meeting. The minutes recorded that "Mr. F.M. Crosby said that he wished to state for the record that should we in the future contemplate entering into further negotiations with James Stewart & Co. in connection with our building operations, we carefully investigate their standing and responsibility at fulfillment of contracts, as some doubt had of late been cast upon their integrity in this respect."⁴⁵ Nevertheless, James Stewart and Company, Inc. used a view of the new elevator in their trade advertisements, which carried the name of W.R. Sinks, Manager of the Grain Elevator Department.⁴⁶

By the late 1920s, the milling complex at St. Anthony Falls again was short of grain storage space, a situation that would lead to the construction of WCCO Elevator No. 3 a short distance from No. 2. The arguments behind the need for the structure are not found in the

⁴³ Franklin M. Crosby, "Report of the Wheat Department," 7, in "Annual Report, 1916-17," GMIA.

⁴⁴ Ibid., 7-8.

⁴⁵ "Washburn-Crosby Company, Book of Minutes, No. 3," March 26, 1917, 249-50, GMIA.

⁴⁶ See advertisement in *American Elevator & Grain Trade* 35 (December 15, 1916): 349.

various corporate records or in the industry literature. The reason may be found in the structure itself, since it is only a storage annex to No. 3, and not a new, independent elevator. It merely increased the storage capacity of No. 2 and had no loading, unloading, or cleaning capacity of its own, beyond the conveying systems necessary to move grain from No. 2 to No. 3 and back again. No. 2, on the other hand, was designed to meet several needs, such as increased unloading and shipping capacity, in addition to pure storage space.

Minutes from directors and stockholders meetings of General Mills, Inc., indicate a rebuilding program at the Minneapolis facility, resulting in part from a major fire at the A Mill on September 16, 1928.⁴⁷ The only direct reference in the minutes to storage needs occurred at the directors' meeting of November 9, 1928. During a discussion of corporate finances, "Mr. F.M. Crosby thereupon stated that he could justify expenditures for additional wheat storage capacity, but was not prepared to say definitely at the present time where such additional capacity should be built."⁴⁸

It is also known, through a WCCO "Study of Milling Facilities" dated February 18, 1928, that there was "unquestionably an excess of [milling] capacity at Minneapolis." In 1927, according to the study, the Minneapolis complex was producing flour at 79 percent of its production capacity. The study was intended to provide information to help decide the question: "shall we plan to proceed with what we have, or shall we adjust our facilities to the most economical arrangement as regards raw material and manufacturing costs in relation to distribution areas?" While the study offered no conclusion regarding new elevator storage, it seems possible, given the subsequent evidence of the corporate minutes, that the excess capacity may have been due to an inadequate supply of wheat to the mills.⁴⁹

Whatever the corporate logic, the bare outlines of the elevator project were reported in the company's and the industry's publications. In March 1929, the *Northwestern Miller* announced that "Washburn Crosby plans enlarged storage space," and noted a "proposed new elevator of 1,800,000 capacity," with a tunnel and overhead gallery connecting it with the existing No. 2 elevator.⁵⁰ A Minneapolis City Council ordinance authorizing the tunnel

⁴⁷ GMI, Stockholders and Directors Minute Book No. 2, July 27, 1929, p. 73, in GMIA.

⁴⁸ GMI, Stockholders and Directors Minute Book No. 2, November 9, 1928, p. 6, in GMIA.

⁴⁹ "Study of Milling Facilities, Washburn Crosby Company, February 18, 1928," typescript copy in Reports, Corporate Legal Files, GMIA.

⁵⁰ "Washburn Crosby Plans Enlarged Storage Space," *Northwestern Miller*, March 27, 1929, 1188.

and gallery was passed at a special meeting on April 8.⁵¹

On April 15, 1929, *American Elevator and Grain Trade* reported that "a 1,800,000-bushel grain elevator will be erected at Minneapolis, Minn., by Washburn Crosby Company. Estimated cost of the new structure is \$500,000."⁵² By May, the news reports had corrected the new elevator's capacity to 2,500,000 bushels and announced the awarding of contracts "to a Chicago firm."⁵³ In June and July, Minneapolis building permits were approved for engineer Edwin Ahlskog to construct a 44-bin reinforced-concrete grain elevator.⁵⁴ The plans for the structure were prepared for General Mills in June, July, and August by Ahlskog, who is identified as a contracting engineer in Chicago.⁵⁵

The foundation for the annex was in place by mid July.⁵⁶ General Mill's "Annual Report to the Board of Directors by James F. Bell President," issued on May 31, 1929, noted only that "we have also authorized and have under construction at Minneapolis 2,250,000 bushels wheat storage, but as this is not completed it is not included in this year's expenditures."⁵⁷

The only direct statement about the new facility's reason for being appeared in the published *First Annual Report of General Mills, Inc.*, in the letter to stockholders from James Ford Bell, dated July 25, 1929:

. . . contracts have been let for the construction of an elevator of 2,250,000

⁵¹ See *Proceedings of the City Council of the City of Minneapolis, Minnesota, from July 1928 to July 1929* (Minneapolis: City Council, 1929), April 8, 1929, 1093-95.

⁵² *American Elevator and Grain Trade* 47 (April 15, 1929): 622.

⁵³ "General Mills Awards Contracts for Elevator," *Northwestern Miller*, May 22, 1929, 734.

⁵⁴ Minneapolis Permit No. A-19485, July 28, 1929, states that the new elevator was to be for a 132'x 217' foundation at a cost of \$35,000; Permit No. A-19539, July 23, 1929, was to erect 44 round, reinforced-concrete grain tanks, each to be 24.5' in diameter and 115' high, at an estimated cost of \$188,000. Permits in Minneapolis Department of Inspections.

⁵⁵ Research has identified little information about the identity and background of Ahlskog, beyond a reference in the 1928-29 Chicago city directory that listed Ahlskog as a structural engineer. Research has not identified the contractor that constructed the elevator.

⁵⁶ *American Elevator and Grain Trade* 48 (July 17, 1929): 47.

⁵⁷ "Annual Report to the Board of Directors by James F. Bell, President," typescript, May 31, 1929, p. 4, in Reports, Corporate Legal Files, GMIA.

bushels capacity at Minneapolis. The increase of storage facilities removes to some extent the hazards of forward selling and is of material assistance in the selection of wheats of proper quality.⁵⁸

Description and Operation of WCCO Elevators No. 2 and No. 3

WCCO Elevator No. 2: Description

WCCO Elevator No. 2 was built as a receiving elevator for the WCCO/General Mills flour-milling complex. The elevator structure is comprised of a large section of storage bins; a headhouse containing conveying and cleaning equipment and associated storage bins; and a track shed for unloading and weighing grain. Grain was received from railcars, cleaned if necessary, stored in bins, and shipped via belt conveyor to Elevator No. 1 and the milling complex nearby. Elevator No. 2's storage capacity is nominally 2,168,000 bushels, utilizing 45 circular tanks and 61 interstice bins. (Interstice bins are formed by the irregular open space created where round tanks meet each other).

WCCO Elevator No. 2 is located at 900 Second Street South, where it occupies Tract C in Block 118, Auditors Subdivision 41, Minneapolis, a 76,026-square-foot parcel of land bounded by Ninth and Tenth avenues south on the east and west, Second Street South on the south, and railroad property on the north. The elevator is aligned on an east-west axis, parallel with the railroad property line. It is situated approximately 550' southeast of WCCO Elevator No. 1 and the Washburn A Mill complex, with which it is linked by a 592' conveyor tunnel for shipping grain from the elevator to the complex.

The footprint of the bin section of the structure is 312'-9" x 96'-9", outside to outside. The only notable addition to the footprint is the track shed, which is 173' long and extends 75'-6" from the north wall.⁵⁹

The 45 circular bins rise 118' from the basement foundation, and the bin tops are approximately 95' above grade. The bin walls are 7", slip-formed, reinforced concrete.

⁵⁸ In *First Annual Report of General Mills, Inc., June 1, 1928, to May 31, 1929, July 25, 1929*, unnumbered page, copy in GMIA

⁵⁹ These and subsequent dimensions are from WCCO Drawing No. 81-291, "Elevations of Elevator No. 2," General Mills Inc. Engineering Dept., June 3, 1930; and "Sketch No. 1 MI-203X," "No. 2 Elevator Building & Equipment Plans and Elevation," GMI Engineering Dept., December 26, 1932 (both drawings in Storage Tube No. 1480). Dimensions also are from "Description of Improvements," in "1985 Market Value Appraisal: General Mills, Inc. Washburn Grain Elevator, Minneapolis, Minnesota," typescript, American Appraisal Associates, Milwaukee, Wisconsin, May 9, 1985, pp. 13-16; copy in Minneapolis Community Development Agency (MCDA), City of Minneapolis.

Running almost the full length and width of the bin tops is the one-story conveyor gallery, identified in No. 2 as the fourth floor (in other elevators it would be called the "bin deck"). Where it is incorporated as part of the headhouse (described below), the fourth floor interior height rises to about 18', enclosing an open, two-story space designed to house the turnheads that distribute grain to the bins below.

Rising from the basement to a height of 60'-6" above the bin tops is the headhouse (sometimes known as a "working house"), which is 102' x 25' in plan and takes the place of five circular tanks. The north exterior wall of the headhouse extends the structure's full height from the basement. In the lower area of the headhouse, in the place of the five circular tanks, is a series of smaller, rectangular bins. Within the upper area of the headhouse is the sixth floor or "motor" floor and the seventh and top floor, also known as the "head floor." The "missing" fifth floor is a 24-foot-square reinforced-concrete room, which rises on columns from the bin top floor and extends above the roof of the fourth floor. It houses controls for the turnheads. Extending 18' above the bin tops at the west end of the elevator are three large shafts that ventilate the basement area. The track shed is located at grade, at the base of this exterior wall.

All power in the elevator was electric when built. Other utilities included an internal telephone system; pneumatic ticket conveyors between the scale room and the control room; and a Day Dust Collecting System. Machinery, including the trippers, was supplied by the Weller Manufacturing Company of Chicago.⁶⁰ Motors were from the Allis Chalmers Manufacturing Company, Chicago; Morse Chain Drives were furnished by the Strong-Scott Manufacturing Company of Minneapolis.⁶¹

The elevator's foundation is termed a "reinforced concrete mattress." The framework of the non-bin areas is comprised of reinforced-concrete columns and beams. Floors are reinforced concrete. Doors and windows are industrial steel sash with hollow-metal doors with hollow metal frames. There are miscellaneous steel stairs and ladders, including a spiral steel stair in one of the interstice bins that provides complete access from basement to the top floor. The roofs are reinforced concrete with built-up composition cover.

⁶⁰ The "tripper" is a large, ingenious machine designed to ride on rails while straddling a grain conveyor running above the bins or tanks (see photograph HAER No. MN-92-27). The conveyor belt is threaded between large rollers on the tripper to serve two functions: (1) to allow the stationary tripper to off-load the grain from the moving conveyor and spout it into a bin opening alongside the conveyor; or (2) to move the tripper forward or backward along the conveyor, by allowing the tripper to clutch or grip the moving conveyor belt long enough to pull itself along on its rails.

⁶¹ "New Washburn-Crosby Elevator at Minneapolis," *American Elevator and Grain Trade* 35 (December 15, 1916): 359.

Among the most significant features of Elevator No. 2 at the time of construction was the track shed and its unloading and weighing mechanisms. This was especially important since a receiving elevator is designed more to receive than to ship out, and this particular elevator was intended to provide greatly needed, high-speed unloading facilities (see discussion in section above about the need for Elevator No. 2).

The track shed includes a 2-story reinforced-concrete building with a clerestory above the scale room and two skylights. There is a deep basement where the car-unloading hoppers and scales are installed. Above the track area is the well-lit, maple-covered, scale floor with its extremely large--almost sculptural in form--scale levers, fulcrums, and beams with weights. Four receiving tracks pass through the shed with three car pits on each track. Heavy-duty car pullers position the cars over the pits. In each pit is a receiving hopper with a 2,000-bushel scale hopper directly below, which is mechanically linked to the scale floor above the tracks. Three 36" belts beneath the scale hoppers convey the weighed grain to the elevator legs, which raise the grain to the system of distributing spouts above the circular bins.

WCCO Elevator No. 2: Operations

The unloading operation is outlined in a contemporary description of the newly completed elevator:

The weighman has a ticket for each car giving the car number, amount of grain, etc., and the bin into which it is to be placed. The trackman receiving the car informs the scaleman by means of a speaking tube what car is to be unloaded. The scaleman then puts the ticket into the recording attachment on the scale and is ready to weigh. When the grain doors [on the boxcar] are opened, grain falls into the hopper below the tracks. The hopper gate is opened permitting grain to discharge into the scale hopper. The work of unloading the car with scoops is then commenced.

When all of the grain is discharged into the scale hopper the weighman is notified by signal. The load is then weighed. The car ticket having the grain weights printed thereon is sent through a pneumatic tube system to the distribution office over the storage bins from which point the distribution of grain is controlled. While the above operations are in process the weighman can observe same through an opening in the scale floor covered with plate glass.⁶²

If any grain cleaning was necessary, the grain would be transported directly into cleaning

⁶² "A Real Novelty in Receiving Track Shed," *Grain Dealers Journal* 38 (May 10, 1917): 755.

machines after unloading and weighing. Following cleaning it would be moved to storage bins.

The distribution of grain into storage bins was described as follows:

There are three cross conveyors provided, one for each leg. The cross conveyors discharge into a turnhead from which the grain may be spouted to the adjoining bins or to two of the three 36-inch transverse storage conveyors. These transverse conveyors are provided with trippers by means of which the grain may be spouted direct to the bins.

All grain received may be spouted directly to the bins by controls located in the distribution office [control room] with the exception of 24 circular bins and 18 interspace [interstice] bins which are reached by the three transverse storage belts.

This spouting is done by means of 10 large turnheads, each turnhead serving approximately nine bins. The turnheads are operated by means of gears and shafting from the distribution office [control room]. Each of the three receiving legs is also provided with a turnhead just below the cleaning machine, as is also the cleaner leg. By means of these turnheads one man is enabled to spout 1,250,000 bushels of grain direct from the distributing office without having to set any trippers or fixed spouting other than moving the turnheads.⁶³

The removal and shipping-out of the grain was as follows:

For removing the grain from the bins, nine short 36-inch cross conveyors are provided. These cross conveyors discharge onto two long 36-inch transverse conveyors. The long transverse conveyors belt the grain to the northeast corner of the elevator where the grain is discharged into spouts which conduct it down through an open shaft in the limestone rock to the belt conveyor tunnel [to Elevator No. 1 and the milling complex].⁶⁴

WCCO Elevator No. 3: Description

WCCO Elevator No. 3 is a storage annex for Elevator No. 2. It was designed exclusively for storage and included no unloading or shipping-out facilities other than an overhead conveyor

⁶³ "New Washburn-Crosby Elevator at Minneapolis," 359.

⁶⁴ "New Washburn-Crosby Elevator at Minneapolis," 359.

to bring grain from No. 2 and an underground tunnel to send grain back to No. 2. The nominal capacity of Elevator No. 3 is 2,272,000 bushels, comprised of 44 circular bins, 31 interstice bins, and 8 outerstice bins.

WCCO Elevator No. 3 is located at 1000 Second Street South on Tract D, a 28,440-square-foot parcel located in Block 117, Auditor's Subdivision 41, Minneapolis. The property is at the northeast corner of Tenth Avenue South and Second Street South. The elevator is aligned on an approximate north-south axis.⁶⁵

The elevator footprint is 131'-9" x 216'-11", out-to-out, with bins rising 117' from the foundation (and approximately 93' above grade). The bins have an inside diameter of 23'-3". The bin walls are 7" thick, except where the wall also serves as the exterior elevator wall, in which case it is 12" thick. Atop the bins is a 9' high conveyor gallery, largely covering the entire bin top area. Beneath the bins are four full-length, 10' deep conveyor tunnels.

The bins are loaded by three overhead conveyor belts with three Webster two-way self-propelled trippers. All grain in Elevator No. 3 is shipped only to and from Elevator No. 2, via either a conveyor in a metal-clad, steel-frame, overhead conveyer gallery or a conveyor in a reinforced-concrete tunnel. The overhead gallery and tunnel connect the northeast corner of Elevator No. 2 with the northwest corner of Elevator No. 3. The distance between the exterior walls of the two elevators at that point is approximately 90'.

Subsequent Use and Ownership of Elevators No. 2 and 3

In 1965, General Mills closed its flour-milling operations at the St. Anthony Falls milling complex. Elevators Nos. 2 and 3 continued in operation, but their function changed to a grain merchandising operation. In 1969, structures and machinery were added to Elevator No. 2 to enable the elevator to ship grain out to barges on the nearby Mississippi River. The barge-loading facility was created through an easement arrangement involving General Mills, the neighboring J.L. Sheily Company, and the U.S. Army Corps of Engineers.⁶⁶

In 1987, the city of Minneapolis, through the Minneapolis Community Development Agency

⁶⁵ This and following information and dimensions are taken largely from "Description of Improvements," in "1985 Market Value Appraisal: General Mills, Inc. Washburn Grain Elevator, Minneapolis, Minnesota," typescript, American Appraisal Associates, Milwaukee, Wisconsin, May 9, 1985, pp. 13-16, copy in MCDA, City of Minneapolis. Additional dimensions are from drawings for Elevator No. 3 by Edwin Ahlskog, Consulting Engineer, for General Mills, Inc., 1929, copies in GMIA.

⁶⁶ See "Appraisal," 8, 55, 58. The barge loading facility included an overhead belt conveyor, a loading hopper, and a barge dock accommodating three barges.

(MCDA) purchased the two elevators from General Mills for \$8 million and leased them back to General Mills for their continued use. By the end of 1993, General Mills ceased using the elevators. They vacated the property and terminated all leases effective January 31, 1994. Leases for the barge-loading facility were terminated around the same time, and the structures were demolished. Elevators Nos. 2 and 3 have been vacant since the end of their use by General Mills.⁶⁷

Project Information

Following several studies evaluating possible reuses for Elevators No. 2 and No. 3, the MCDA concluded that there was no option that was economically or structurally feasible. Based on this conclusion, the agency decided to demolish the structures. It plans to develop the site for a use appropriate to the area, which has been designated as the Technology Corridor, Research and Development District.

Elevator No. 2 is a contributing element in the St. Anthony Falls Historic District, which is listed in the National Register of Historic Places. Elevator No. 3 is also considered a contributing element to that district by the State Historic Preservation Office. To mitigate the loss of the elevators, the MCDA commissioned this HAER documentation. It circulated a request for proposals to historical consultants to complete the project, and in February 1997 awarded the contract to Hess, Roise and Company of Minneapolis. Charlene K. Roise, president of Hess Roise, served as principal investigator and project coordinator. The report was written by Robert M. Frame III, with research assistance from Denis Gardner. Ann Gaasch packaged the final report and provided other clerical help. Hess Roise retained Jerry Mathiason, a Minneapolis photographer, as a subconsultant to complete the photographic documentation. Judy Cedar was project coordinator for the MCDA.

⁶⁷ "City to Buy General Mills Elevators on Riverfront," *Minneapolis Star & Tribune*, December 20, 1986. See also correspondence, Robert P. Walton, Director Corporate Real Estate, GMI, to Judy Cedar, MCDA, City of Minneapolis, September 28, 1993: "This letter will serve as notice of our intention to vacate the above captioned premises. . . . The lease for elevator No. 3 will terminate effective November 30, 1993 . . . ; and the lease for Elevator No. 2 will terminate effective January 31, 1994." Copy in folder "GMI & Corps Leases & Termination," file for Blocks 6 & 7, MCDA, City of Minneapolis.

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